

REMARKS

In connection with Applicants' Request for Continued Examination (RCE), Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. § 1.114, and in light of the remarks which follow.

Claims 15-22 and 24-37 are pending in the application. Claim 23 has been cancelled.

Claim 15 has been amended to recite the step of cooling and chopping is performed at the die outlet. Support for this amendment is found in the specification on page 7, line 29 to page 8, line 5.

Applicants gratefully acknowledge the Examiner's withdrawal of the objection to the specification and the withdrawal of the rejection of Claims 15-18, 20-22, 25, 29 and 32-33 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Pontiff (EP0450205).

Claim Objections

Claim 23 is objected to as being in improper dependent form for failing to limit the subject matter of a previous claim.

Claim 23 has been cancelled, rendering this objection moot.

35 U.S.C. §103(a) Obviousness Rejection

1. Claims 15-18, 20-25 and 29-33 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Pontiff (EP 0 450 205) in view of Al Ghatta et al. (U.S. Patent No. 6,306,921)

Applicants respectfully submit that claims 15-18, 20-25 and 29-33 are not obvious over Pontiff in view of Al Ghatta.

To establish a *prima facie* case of obviousness, three basic criteria must be met. (MPEP 2143) First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Secondly, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Pontiff relates to a process for producing shrunken moldable beads of foamed thermoplastic polymers, e.g., polyolefins, and particularly beads of crosslinked polyolefins. (See Pontiff at page 1, lines 5-10.) Pontiff teaches extruding and cutting the melt to form foam beads. (page 4, line 35) Pontiff does not teach the step of cooling and chopping is performed at the die outlet. The following teachings of Pontiff are relevant to distinguishing the instant invention from Pontiff.

The resultant foam strands are cut as they emerge from the die so that they are cut while the foam is still expanding. In this manner, beads are produced, forming substantially closed cells with a thin skin present on the entire surface of each bead. As the beads cool, they will shrink rapidly (preferably within about 15 minutes, at the most within about one hour), provided that the proper balance between cell size, permeability of the foam cell walls to air and other blowing agent properties is present. Various materials commonly used as anti-aging additives for thermoplastic polymers can be included in the polymer mixture to adjust the relative permeability of the cell walls to the blowing agent to a higher or lower value, as compared to air, as described below. The permeation rate of air and/or a blowing agent

through the polymer material can be measured according to ASTM D-1434 with the test gas at a pressure of one atmosphere, or the equilibrium vapor pressure of the gas at 23 °C if its boiling point is greater than 23 °C. The crosslinking of the polyolefin then commences with exposure to the moisture present in the ambient atmosphere. The beads can be collected after cutting and conveyed to a suitable storage area, such as a porous bag, and held until the crosslinking reaction has proceeded to the extent that the crosslinked polyolefin beads are heat stable enough to be molded. (page 7, lines 30-42)

As the beads are cut at the die face, they fall into a collection bin where they can be drawn out pneumatically or by other suitable means and conveyed to a collection area, preferably a breathable bag which will allow air to pass through fairly easily. The expanded beads in storage will promptly shrink and then crosslink through contact with the moisture contained in the air. The blowing agent will generally dissipate within about 24 hours or less. After about three days, the crosslinking generally has proceeded enough to impart to the foam beads the thermal resistance which aids in molding. Any additional exposure of the beads to moisture prior to molding will help accelerate crosslinking. Such exposure could include conveying the beads from the cutter using water with subsequent drying prior to bag storage or blowing moist air through the storage bag during bead storage and aging. Although not required for moldability of the shrunken beads, crosslinking is preferred for beads which are to be used for molding complex parts or parts with close physical tolerances, as it widens the "window" of acceptable temperatures for molding.(page 8, lines 45-54)

Pontiff teaches away from cooling the expanded material with a liquid fluid at the die outlet as required by the instant claims. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F3d 551, 553, 31 USPQ2d 1130, 1131. (Fed. Cir. 1994) While Pontiff recognized that the beads could be conveyed from the cutter using water, and recognized that water could be used to affect cross-linking, one of ordinary skill in the art would recognize that the absence of a teaching in Pontiff for cooling the extruded material

with a liquid at the die head must be due to some effect that would render the invention non-operative, especially when Pontiff teaches that the material could be conveyed from the cutter with water. One of ordinary skill in the art would recognize that cooling the material at the cutter with water would affect the permeability of the outer surface of the beads in Pontiff and that such permeability is a key element in the invention of Pontiff.

Al Ghatta teaches:

The beads, directly after being cut, are propelled away from the rotating blades due to the centrifugal force they apply and are collected in cooling bath of water kept at relatively low temperatures (10-15°C).

Rapid cooling of the beads allows to maintain surface crystallinity at relatively low values.

The crystallinity of the beads is generally lower than 10%.

The resulting beads have the characteristics of a fine and uniform microcellular structure (cell size between 50 and 500 microns) in the outermost layer and a macrocellular structure, with cell sizes of a few millimeters, in the central part. (col. 2, lines 52-64)

One of ordinary skill in the art, upon reading Al Ghatta would recognize that while Al Ghatta teaches the use of rapid cooling to maintain low amounts of crystallinity, the beads in Al Ghatta still require a fine and uniform microcellular structure in the outermost layer. One of ordinary skill in the art, upon reading Al Ghatta would also recognize that cooling with a liquid at the cutter die would affect the fine and uniform microcellular structure in the outermost layer.

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to

combine reference teachings. There is no suggestion or motivation in Pontiff and Al Ghatta to modify Pontiff to obtain the method of the present invention, which requires cooling the extruded material with a liquid at the die head. Both Pontiff and Al Ghatta teach away from making such a change. Therefore, there is no suggestion or motivation, either in the cited reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings to obtain the invention of the instant application.

To establish a *prima facie* case of obviousness, there must be a reasonable expectation of success. There cannot be a reasonable expectation of success in cooling the extruded material with a liquid at the die head when both Pontiff and Al Ghatta teach away from making such a change. Therefore there would not be a reasonable expectation of success in obtain the Applicants' invention by modifying Pontiff using the teachings of Al Ghatta.

To establish a *prima facie* case of obviousness, the prior art reference must teach or suggest all the claim limitations. It was shown above that neither Pontiff nor Al Ghatta teach or suggest cooling the extruded material with a liquid at the die head. Both Pontiff and Al Ghatta teach away from making such a change. Therefore Pontiff and Al Ghatta do not teach or suggest all the claim limitations.

Applicant respectfully submits claims 15-18, 20-25 and 29-33 are allowable over Pontiff in view of Al Ghatta.

2. Claim 19 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Pontiff (EP 0 450 205) in view of Al Ghatta et al. (U.S. Patent No. 6,306,921) and in view of Amano et al. (U.S. Patent No. 5,234,640)

Applicants respectfully submit that claims 15-18, 20-25 and 29-33 are not obvious over Pontiff in view of Al Ghatta and in view of Amano.

The teachings of Pontiff and Al Ghatta have been discussed above.

Amano teaches forming a primarily foamed thermoplastic polyester series resin (PET) by quenching the foamed material to the glass transition point of PET or lower. Amano does not provide information on the quenching process in producing this material except for Example 1, where the die, not the material, was cooled with water. (col. 9 lines 29-31) Amano teaches that quenching affects the crystallinity of the material formed on quenching. Amano teaches production of material from the above resin using heated water and/or steam.

Claim 19 depends from Claim 15. Amano does not overcome the deficiencies of Pontiff and Al Ghatta. In fact, Amano merely reinforces the position maintained above that cooling the extruded material with a fluid at the die would affect the physical properties of the material produced.

Therefore Claim 19 is not obvious over Pontiff in view of Al Ghatta and in view of Amano.

From the foregoing, Applicants earnestly solicit further and favorable action in the form of a Notice of Allowance.

If there are any questions concerning this paper or the application in general, Applicants invite the Examiner to telephone the undersigned at the Examiner's earliest convenience.

Respectfully submitted,

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